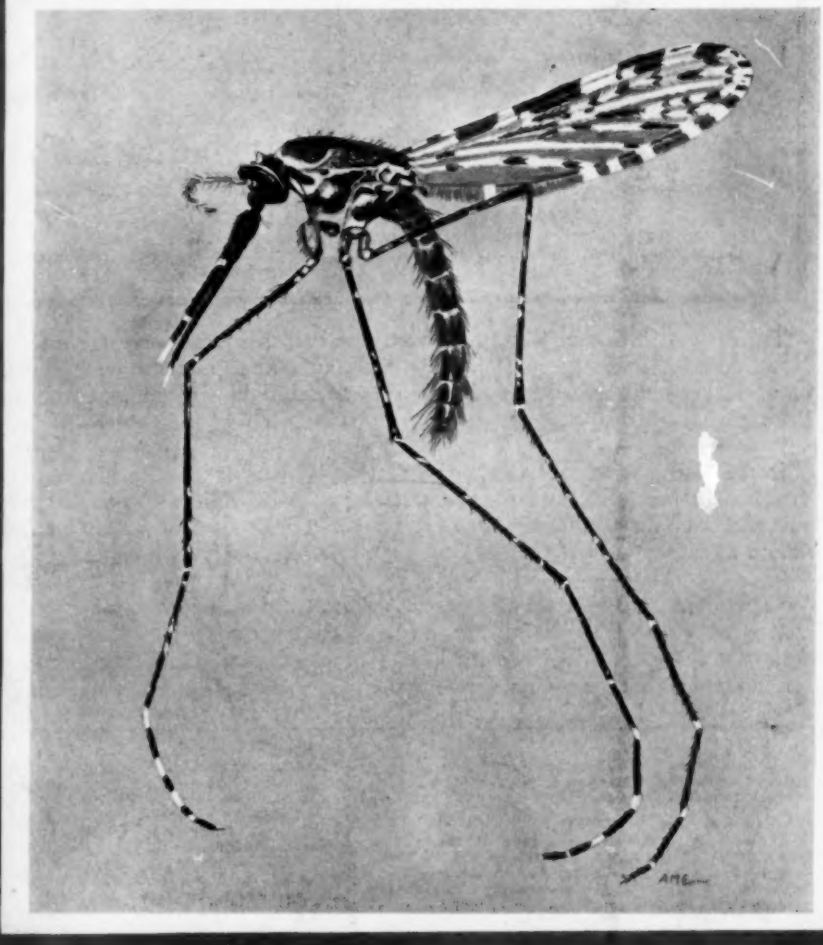
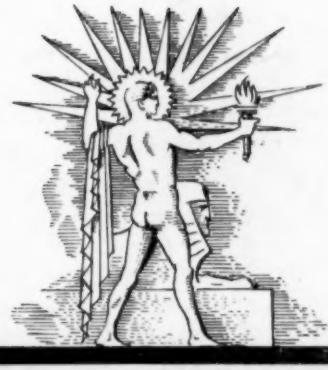
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •





April 15, 1939

Enemy Invader

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A SCIENCE SERVICE PUBLICATION

Do You Know?

Cabbage eaten by ancient Greeks and Romans did not "head," but was more like kale.

Over 1,000,000 persons in South America have been vaccinated against yellow fever.

A census of shrimp off the Maine coast indicates enough shrimp there in winter and early spring for profitable fishing.

The old Kimberley Diamond Mine in South Africa is a man-made crater 38 acres in extent and hundreds of feet deep.

The first postage stamp in America to have an agricultural design was a stamp showing llamas, issued by Peru in 1866.

Wisconsin bird fans have organized a Wisconsin Society of Ornithology for both amateur and professional students of bird life.

One of the General Land Office's best seller publications is a 12-page astronomical almanac used by engineers in surveying and mapping.

Arithmetic useful to farmers: a hen that produces 200 eggs a year requires only 10 per cent. more food than a hen producing 100 eggs.

New grade school buildings in New York City are to be eight stories high in a central tower, with elevators capable of carrying a whole class at a time.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

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CHEMISTRY

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CHEMISTRY—MEDICINE

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PSYCHOLOGY

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What effect has high altitude on vision? p. 238.

What happens to your breathing when you daydream? p. 237.

Why did psychologists train rats to wear a harness? p. 228.

To carry television programs from New York to as far as a Philadelphia broadcasting station would require cables costing about $500,000.

In the past generation, Canada's immigrants have come from so many sources that the melting pot there is almost as varied as in the United States.

Experiments have shown repeatedly that grazing animals bunch up on a well-fertilized part of a large field, preferring grass that grows on fertile soil.

British scientists recently measured the sound absorption of fresh snow, to understand better the quietness following a snowfall.

Oil gushers are no longer hailed with joy; it is considered wasteful carelessness or a bad accident in an oil field when oil gets away from control.

A Polish scientist says that a fellow countryman was first to record the potency of sunlight in preventing and curing rickets, in a book written in 1822.

SCIENCE NEWS LETTER

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MEDICINE

Sulfapyridine Under Study as Weapon Against Tuberculosis

Large Doses Helped Guinea Pigs Fight the Disease After Inoculation With Virulent Germs

SULFAPYRIDINE, potent new chemical remedy in pneumonia, is now under investigation as a weapon against tuberculosis.

Results of the experiments, by Drs. W. H. Feldman and H. C. Hinshaw, of the Mayo Clinic "do not imply that sulfapyridine would be of value in the treatment of tuberculosis," it is stated.

Guinea pigs, however, which are extremely susceptible to human tuberculosis germs, were protected against such germs to some extent by the new drug. This was given in large doses, starting several days before the animals were inoculated with virulent human tuberculosis germs, and continued twice daily for the course of the experiment. Smaller doses at more frequent intervals might have been more effective, it is thought.

Of 12 animals treated with sulfapyridine and living longer than three weeks after inoculation with tuberculosis, six showed no gross signs of tuberculosis in liver, spleen or lungs. Definite tuberculous involvement of these organs appeared in one of the animals, while of the others, four showed involvement of the lungs with questionable involvement of the spleen and one showed possible involvement of the spleen only.

Signs of tuberculosis, usually extensive, appeared in all the animals in a control group which were inoculated with tuberculosis germs but did not receive the sulfapyridine treatment.

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LARGEST AND SMALLEST

James H. Quinn, of the Field Museum staff is showing his daughter Dixie Lee how tiny a humming-bird egg is in contrast with the casts he has made of the eggs of the prehistoric elephant bird (aepyornis). These are probably the world's largest and smallest eggs.

ENTOMOLOGY—PUBLIC HEALTH

Hostile African Native Invades South America

Invader is a Mosquito, Dangerous Anopheles Gambiae; She Brings Menace of Disease Close to United States

See Front Cover

IT WOULD be ominous news if Italy or Germany established an unfriendly air base in South America. More disturbing is the real news that a hostile native of Africa has invaded South America and is making itself very much at home in Brazil.

This new invader of the Western Hemisphere is a mosquito. It is dangerous because it carries malaria of a serious and often fatal type.

Called Anopheles gambiae, it is the most dangerous member of a dangerous family. This latest insect invasion sends an apprehensive shudder down the spine of public health officials who recognize the danger not only to the area it now occupies but to the whole of the American continent.

There will be a grim tightening of quarantine regulations. The vacuum cleaner and insect spray gun used as weapons of defense against disease-bearing stowaways of the air will be used with even greater care. For Pan American Airways has one of its many South American stations at Natal, Brazil, where Anopheles gambiae successfully landed in America some years ago.

Air travel with its great saving in time brings with it the danger of spread of disease epidemics. The invasion by Anopheles gambiae is laid to one of the pioneering transoceanic attempts, the French airline between Dakar in West Africa and Natal in Brazil.

This mosquito was a stowaway either on one of the airplanes or one of the fast French destroyers which in 1930 was working in connection with the airline establishment.

The mosquito was detected by Rockefeller Foundation scientists shortly after its arrival within the city limits of Natal. There was hope then that the invasion might be limited to that region alone by natural conditions unfriendly to this mosquito. But just the reverse occurred.

Outbreaks of malaria of unprecedented severity accompanied the spread of the invading mosquitoes. Two dry years checked the invasion but immediately thereafter, with normal rainfall, the onward flight started again.

Last year severe epidemics of gambiae-carried malaria occurred in localities over 200 miles west and north of Natal. Farming and other phases of daily life in the Jaguaribe Valley of the State of Ceará suffered disruption because of 50,000 cases of malaria. Nine out of ten of the population were ill and one out of ten died.

Fortunately, the Rockefeller Foundation's yellow fever service had been working in this South American region, fighting the dangerous scourge of "yellowjack." Their scientists spotted the arrival of gambiae mosquitoes. With quinine and control measures, they are now cooperating with the Brazilian government in a vigorous defensive against the mosquito invader in the hope of confining it to the comparatively arid areas that it now occupies. There is even hope of exterminating it.

There was great apprehension on the

part of the scientists that if the gambiae should break through to the well-watered Parnahyba and Sao Francisco river valleys, it will spread not only to a large part of South, and Central America but perhaps even to North America and the United States. The seriousness of the situation will be well realized from the fact that the gambiae mosquitoes have already covered half of the five hundred miles from Natal to the Parnahyba Valley.

America's medical frontier extends to far corners of the earth in fighting such diseases as malaria and yellow fever. While the actual scene of this malaria campaign or the constant fight against even more serious yellow fever is thousands of miles away from us, the scientists engaged in this warfare are protecting us as much as they are the population closer to the battle.

The mosquito is one of the world's most dangerous animals because of the diseases it can spread. A medical disaster which would cause the present South American invasion to pale into insignificance would be the introduction of yellow fever into India. In that land of teeming millions of uneducated people there are mosquitoes capable of transmitting yellow fever. Just one unsuspected or uncontrolled yellow fever patient might start an epidemic of horrible proportions. Even in a world which may become internationally more disordered than it is, it will be extremely important to maintain rigidly the travel from Africa where yellow fever is widespread to India where its presence would bring such disaster.

False Confidence

A few years ago it was thought that yellow fever had been wiped out of South America. Then it was found that a peculiar type of jungle yellow fever was being spread by mosquito species other than Aëdes aegypti, formerly called Stegomyia. In the jungles of South America yellow fever is kept alive. It lies in wait for laborers and travellers, and there is always danger it will escape through them and mosquitoes to the more heavily populated farming and city regions.

Warfare against yellow fever has been resumed doggedly, not alone to protect those who run the risk now of contracting the disease, but because millions yet unborn may die of it in the United States and elsewhere if the disease were unchecked. Not many decades ago Philadelphia and other American cities were ravaged by yellow fever.

A new defensive weapon has been developed by the Rockefeller Foundation scientists in recent years. It is an effective vaccination against yellow fever. Already over a million people have been given Virus 17 D, as it is known. Scientists are vaccinated so as to safeguard them in working with yellow fever. Airline personnel are protected so that they will be unable to carry the disease swiftly to other geographical regions.

Against the two mosquito-borne plagues, malaria and yellow fever, medicine is now engaged in a life and death campaign. The dispatches from this peacetime front will be important to the future of mankind.

The picture of Anopheles gambiae on the cover of this week's SCIENCE NEWS LETTER is from the *Short Illustrated Guide to the Anophelines of Tropical and South Africa* by Alwen M. Evans (University Press of Liverpool).

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PSYCHOLOGY

Rats in Harness Show How Mental Conflicts Develop

Psychologists Measure Pull Toward Goal and Away From Punishment; Conflicting Drives Cause Breakdown

RATS, dressed in a little harness and running pell-mell down a straight alley to get their food or rushing even faster away from punishment, are revealing to scientists the fundamental natural laws that govern conflicts in the minds of men as well as mice.

Since nervous breakdown in man is caused by the extreme bafflement that psychiatrists call "conflict," these rats running their alleys may be opening the way to prevention of such mental disease.

The psychologists heard how Judson S. Brown, graduate student at Yale University's Institute of Human Relations, used a harness on a pulley arrangement to measure the strength with which rats pull toward their goal. Close to the food, they pull harder to reach it than when they are farther away. When faced with punishment instead of food, the rats pull away from punishment, and again the pull is harder when they are close.

But the influence of the punishment decreases much more rapidly with distance than does the influence of the food. This may explain why humans will undertake plans for the distant future, influenced only by its rosy prospects. As the event approaches, we may get cold feet because the disadvantages have greater force.

In another experiment reported by Seymour G. Klebanoff, fellow graduate student, the rats were released in the center of an alley at each end of which was the food they desired. The rats hesitated, not knowing which way to turn, but when they happened to start in either direction they kept on running toward that end of the alley.

In contrast was their behavior when punishment waited them at both ends. Then a start in either direction would result in increasing tendency to avoid that end. The net result was a tragic oscillation, chronic "changing of their minds." They had conflict.

As explained by Dr. Neal E. Miller, under whose direction these experiments were conducted, "a donkey between two haystacks should have no conflict and certainly would not starve; but a person between the devil and the deep blue sea would be thrown into a severe conflict."

Still more complex was the experiment reported by Dr. Miller himself in which both punishment and food awaited the rats at the end of the alley. The animals, he found, would run for a distance, then, realizing that punishment lay ahead, they would retreat. Hungry rats ran farther before the retreat than rats more recently fed.

Rats punished while eating would thereafter frequently stop eating and sometimes even retreat from their food.

Science News Letter, April 15, 1939

MEDICINE

Liver-Fat Substance Checks Menstrual Bleeding

DISCOVERY of a hitherto unknown substance in the fat of mammalian liver that has the power to stop profuse or prolonged menstrual bleeding is announced (*Science*) by Drs. Harold O. Wiles and Siegfried Maurer of the University of Chicago. The substance, which has not yet been isolated in pure form, has a cumulative effect lasting for months in the case of young women.

Science News Letter, April 15, 1939

CHEMISTRY

Natural Gas Now Potential Source of High Explosives

War Would Find United States No Longer Dependent Upon Glycerol, By-Product of the Soap Industry

AMERICA'S potential wartime needs of high explosives can now be made from natural gas, air and steam, it was announced by Prof. Henry B. Hass, head of the department of chemistry at Purdue University at the 97th meeting of the American Chemical Society in Baltimore.

The way to make two new explosives, nibglycerol trinitrate and nibglycol dinitrate, from these abundant and cheap raw materials is significant for the new chemicals possess properties comparable with nitroglycerol, used for dynamite.

The Purdue research will give the nation potential freedom from dependence on glycerol, common basic material of many explosives used today. Glycerol is a comparatively minor product of the soap industry, Prof. Hass indicated.

Development of explosives from natural gases is helpful to America, for 98 per cent. of the world supply of such gas is concentrated within the continental United States. An insignificant fraction of this gas would furnish all the high explosives which could ever be used, the Purdue chemist added.

The new explosives are as powerful as nitroglycerol and yet are only half as sensitive and can therefore be handled with greater safety. Nitroglycerol is too sensitive for military purposes.

The Purdue contribution, Prof. Hass emphasized, has been the discovery of an easy and new way to produce materials, known as nitroparaffins, by the addition of nitrogen to hydrocarbons. One of the nitroparaffins produced is nitromethane. It has long been known to explosive chemists, he added, that nitromethane would condense with formaldehyde and that the resulting products were high explosives. These are the new products.

Production of the explosives has been in the pilot plant stage of development for some months with the actual work being carried on by chemists of the Hercules Powder Company.

A major factor in the new research, Prof. Hass maintains, is that the process will put a "ceiling" on the price of glycerol at about 15 cents a pound. While normally glycerol sells cheaply, its price rose during the World War to one dollar a pound. Through the new development, this situation would not be repeated if war came again to the United States.

With the cheap and abundant raw materials the supply of the new explosives is limited only by demand in contrast to older methods of making explosives which hinged on the supply of glycerol. Glycerol was plentiful and cheap when much soap making was going on, and scarce and costly when soap production dropped.

The nitromethane used for the new explosives can be made anywhere that natural gas is abundantly available, Prof. Hass pointed out. The condensation with formaldehyde could be carried out in the same plant and the final addition of nitrogen (nitration) could be done near the consumer factory.

Working with Prof. Hass in the original experiments on nitration were H. J. Hibshman and E. H. Pierson, Purdue Research Foundation Fellows.

Power Balance May Shift

Profound upset of Europe's delicate balance of power, probably in favor of Nazi Germany, may result from the discovery.

Though the United States has almost a monopoly of the world's supply of natural gas, the same gases found in it, ethane and methane, may also be obtained by by-product coking of soft coal, of which the Reich has extensive supplies. The effect of the discovery may be comparable to that of Germany's World War development of the Haber process for fixation of atmospheric nitrogen for the manufacture of explosives. That process alone doubled the length of the war, for Germany was cut off by the British naval blockade from access to the world's principal sources of natural nitrates, Chile, and would have run out of powder long before she actually suffered military defeat.

The new process—if it lives up to its promise of a high explosive suitable for use in bombs and shells—provides Nazi military might with another source of supply, for though it is an American discovery, the chances are that it can be duplicated abroad.

T. N. T. is at present the principal

FENCES DEFEAT OCEAN

Cape Hatteras Lighthouse was abandoned a few years ago because the ocean was encroaching on its base. Brush fences built by CCC boys have built up the beach level and forced the water back. Dunes built by the fences can be seen on both sides of the old lighthouse, tallest in America.

high explosive. Its production is limited chiefly by the amounts of toluene, another product of the distillation of coal, made available in coking ovens. But, at the same time the coking ovens are producing toluene, they are turning out ethane and methane in even larger quantities, particularly the latter.

A number of laboratory methods for synthetic manufacture of ethane and methane are known, but none is of commercial importance because of the ease with which the two gases may be obtained otherwise.

A possible limitation on military use of the two new compounds, nibglycerol trinitrate and nibglycol dinitrate, is the fact that they may still be too sensitive to withstand field handling and the explosion of the propellant in the gun. Any high explosive in a shell must be able to stand such a shock—the reason why nitroglycerol is used almost not at all for military purposes is that it cannot stand this. The two new products are half as sensitive as nitroglycerol.

The new explosives can certainly be used in certain aerial bombs, one authority said, as their sensitivity to shock is not too important.

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MEDICINE

Surgical Planting of Pills Hope for Addison's Disease

Buried in Skin in Shoulder Blade Region, Pills Give Patients Six-Month Supply of Life Essential Drug

LITTLE white pills, planted surgically in the body instead of being swallowed, offer new hope for patients suffering from often-fatal Addison's disease. Details of experiments with this type of treatment have just been announced by Drs. George W. Thorn, Lewis L. Engel and Harry Eisenberg, of Johns Hopkins University and Hospital, in the *Bulletin* of the Johns Hopkins Hospital.

Although four patients have already been given this new treatment for Addison's disease with strikingly good results, it is still considered in the experimental stage and will not be available to any but a very small group of patients for at least a year. This is partly because more time is needed to study the method and partly because only a small amount of the chemical given in the pills is available.

The pills, about half the size of aspirin tablets, are made of crystals of a chemical, desoxy-corticosterone acetate, synthesized by Dr. T. Reichstein of Zürich, Switzerland. This is believed to be the same chemical as the life-essential substance produced by the adrenal glands. Failure of these little glands above the kidneys to produce this vital substance, generally called cortin, is the cause of Addison's disease, the wasting ailment that turns the patient's skin dark and which until a few years ago was invariably fatal.

The Johns Hopkins experiments are expected to prove whether or not this chemical is actually the same as the gland's own product, as well as show a new, cheaper and easier way for keeping Addison's disease sufferers alive and comfortable.

Within the last few years physicians have been able to keep Addison's disease patients alive by hypodermic injections of the adrenal gland product, somewhat as diabetics are kept alive and healthy by insulin. This treatment has been both troublesome and expensive.

Many patients must struggle along without the gland extract except when they become acutely and dangerously ill. Then it is given as a life-saving measure, after which the patients gradually relapse into a semi-invalid, hazardous existence made miserable by anemia, weakness and the need to take large quantities of salt every day.

If Dr. Reichstein's chemical proves to be the same as the gland product it should be possible to produce it commercially at a reasonable cost. By making it into pills to be buried under the skin around the shoulder blade region, the patient can be given perhaps a six-months' supply at a single simple surgical operation.

This technique of surgical implantation of a gland product was devised by two English scientists, R. Deanesly and A. S. Parkes, of the National Institute for Medical Research, London, who found it an efficient and convenient method of giving sex hormones.

The pills remain in place and the body draws on the supply of chemical as needed. Dr. Thorn and associates found, from studies of dogs given the pills to make up for complete lack of adrenal glands, that the daily amount used by the animals' bodies was considerably less than they had calculated. This means a saving in the product over what would be given by hypodermic injection.

The crystals dissolve in fat, such as is found under the skin. This makes it possible to give them by implantation. Substances like insulin, which only dissolve in water, could not be given by this technique.

Before giving the pills to Addison's disease patients, Dr. Thorn and associates tried the method on dogs. With both human and animal patients, careful chemical studies must be made before the pills are implanted, to determine the amount of chemical required daily by each. After this has been determined, insertion of six-months' supply is easy.

The operations, which in the Johns Hopkins experiments reported in the *Bulletin* of the Johns Hopkins Hospital were performed by Dr. Warfield M. Firor of the surgical staff, are done with only a local anesthetic. Strict aseptic technique, however, is necessary to guard against germs because Addison's disease patients are especially susceptible to germ infections.

Science News Letter, April 15, 1939

MEDICINE

Tuberculosis and Arthritis To Be Studied in Canada

RESEARCH on tuberculosis and rheumatic diseases will be started shortly in a number of medical institutions throughout Canada, it has been announced by the National Research Council at Ottawa. Decision to give "immediate attention" to these medical problems was reached after consideration of the report of the survey of medical research facilities in Canada made for the Council by Sir Frederick Banting, Nobelist and co-discoverer of insulin.

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●RADIO

Sir William Bragg, president of the Royal Society and director of the Royal Institution of Great Britain and the Davy-Faraday Research Laboratory, will be the guest scientist on the Science Service "Adventures in Science" program over the coast to coast network of the Columbia Broadcasting System, Saturday, April 22, 6:15 p. m. EST, 5:15 p. m. CST, 4:15 p. m. MST, 3:15 p. m. PST. Listen in on your local station.

Dr. John W. Finch, director of the U. S. Bureau of Mines will be the guest scientist on Monday, April 24, at 5:30 p. m. EST.

OLDEST AMERICAN?

The green skull at the left, dug out of North Dakota soil, differs in its beetling brows and narrow nose from the skull of the modern American Indian at the right. They are being compared at the Smithsonian Institution.

ANTHROPOLOGY

Green Skull, New Contender For Title of Oldest American

Discoverer Believes It To Belong to Elusive Folsom Hunter and Therefore More than 10,000 Years Old

A GREEN-STAINED skull, new contender for the title of oldest known American, made its debut before interested scientists at the meeting of the American Association of Physical Anthropologists.

Believed by its discoverer, a North Dakota farmer, to be the actual skull of one of ancient America's elusive Folsom hunters, and therefore more than 10,000 years old, the ancient-looking object was brought to Philadelphia for scientific consultation.

Dr. T. Dale Stewart of the Smithsonian Institution, who brought the skull and has been studying it, finds that the individual to whom it once belonged had heavy brow ridges, a low and sloping forehead, and long, narrow nose. Dr. Stewart and other scientists reserved judgment as to whether this is the appearance of America's ancient roving hunters, or possibly an Indian type of more recent date. Since no remains of Folsom Man have been conclusively identified, what he was like is yet to be established.

The skull was brought to scientific attention when Henry Klebe of Bottineau, North Dakota, reported to the Smithsonian his discovery of the object buried deep and with ancient-looking stone tools nearby. Mr. Klebe's father, he explained, had been a museum man in Europe, and he retained his father's concern in scientific value of such finds.

The tools which accompanied the skull to the Smithsonian have been pronounced by archaeologists too indefinite and nondescript in type to be assigned clearly to any era. None of Folsom Man's favorite weapon, a grooved dart point, is in the collection.

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Longevity and Sex

DID YOUR grandfather and grandmother live to be eighty or over? If they did, you are likely to find more boys than girls if you take a census of your brothers and sisters and cousins.

Positive correlation between longevity in grandparents and predominance of males among their descendants was found in statistical studies reported by Dr. Philip S. Lawrence of the Johns Hopkins University, before the meeting.

Dr. Lawrence made his studies on a larger number of grandparents than the ordinary person is likely to have available. He had data on 837 grandfathers and 886 grandmothers, all from the neighborhood of Baltimore.

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Head Shape Changes

HEADS repeatedly get narrower and wider, in relation to their length, as we pass through birth, infancy and childhood, Dr. C. B. Davenport of the Carnegie Institution of Washington told the anthropologists.

Starting at the middle of the gestation period, the head is about 77 per cent. as wide as it is long. Then it narrows to 70 per cent. at birth. This, in Dr. Davenport's opinion, is probably an adaptation to the form of the birth canal.

Immediately after birth the head widens again, to 74.5 per cent. of the length. At nine months another narrowing has occurred, to 72.5 per cent., "doubtless due to the action of gravity on the walking infant." After more changes, the head at 18 years is about two-thirds as wide as it is long.

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Sexual Maturity at Three

THE TRAGIC case of a little girl who became a physiologically grown woman at the age of three years and seven months and who died at 18 years and seven months was related by Dr. Helen Thompson of the Yale Clinic of Child Development.

The child grew very rapidly for a time when she was about seven years old, but growth stopped at eleven, and by the time she was fifteen she was not as tall as normal minimum for that age. Her head size and shape were normal throughout. Tooth development was normal, but hardening of the bones was accelerated.

From eight and one-half years to eleven years her growth in height was due mainly to increase in body length. Such a pattern of growth, Dr. Thompson said, is normal for girls in their teens but abnormal prior to that age.

Death was finally due to a cancerous condition in the brain.

Science News Letter, April 15, 1939

The earth's curve is about eight inches per mile.

OCEANOGRAPHY

Netherlands Submarine For Study of Gravity

ONE submarine in all the world's bristling array of deadly steel fish has been dedicated to the peaceful work of science. In May, Her Majesty's submarine O-16 of the Netherlands Navy will leave for the East Indies on a new extensive gravity expedition sponsored by the Netherlands Geodetic Commission.

The ship will be commanded by Lieut.-Comdr. B. C. Meurs and the research will be carried out by Dr. W. Nieuwenkamp. This will consist of further investigations of differences of the gravitational pull exercised on different regions of the sea bottom. These differences, or gravitational anomalies as they are called, are due to varying densities in the earth's crust beneath the ocean bottom.

A submarine is necessary for this work because the complex pendulum which is the chief apparatus used must have a steady platform and the submarine can dive beneath the zone of waves and other surface disturbances which would make the work impossible on an ordinary ship.

The method of gravity investigation to be used on the forthcoming research voyage was developed by Dr. F. A. Vening Meinesz and was used by him on similar voyages in recent years.

Science News Letter, April 15, 1939

GENERAL SCIENCE

Darwin Seen As Leading Revised Science of Ethics

DARWIN as the spiritual leader for the sick world and a system of morals and society based on his understanding of man's rise and place in nature—that is the naturalistic philosophy of the California zoologist, Dr. William E. Ritter, honorary president of Science Service.

Dr. Ritter, long a student of man and nature, finds that an understanding of morality can best be arrived at, as Darwin did, by "an adequate analytic description and definition of the human species, Homo sapiens." This implies a human and scientific definition of right conduct, not one divinely revealed or obtained a priori, from cause to effect.

Viewing his fellow scientists, Dr. Ritter senses a strong tendency, especially recently, to conceive science in such a way as to virtually exclude from it the sort of work that led the great Darwin to his theory of evolution. One prominent biologist has contended that Darwin's treatment of the moral problem has "no scientific validity" which to Dr. Ritter is the same as saying that Darwin's treatment of the nature and origin of the living world does not stand up scientifically.

Yet the grand drama of evolution, sketched in such scientific detail by Darwin, is one of the fundamental conceptions of science. Passed are the days when there is any scientific quarreling over the validity of the fundamental idea that man and the higher animals have risen naturally and logically from lower animals during the long ages of earth history. Evolution is an accepted fact of nature.

There is this feeling, born of conventional religious backgrounds perhaps, that evolution does not hold for mind and morals, that man is something entirely apart from his beast ancestors. To this Dr. Ritter objects, holding that natural science corrects and supplements old and varied theories put forth by many religions and philosophies.

Dr. Ritter considers that Darwin did, not alone for biology, but for the science of ethics, what Copernicus did for the science of astronomy.

He wants the Galileos, Keplers, Newtons and Einsteins of evolution to push forward the revised science of ethics.

Science News Letter, April 15, 1939

GEOLOGY

Humans Saw Explosion That Formed Crater Lake

HUMAN BEINGS probably witnessed the terrific volcanic explosion of Mount Mazama that formed the basin of Crater Lake, declares Prof. Howel Williams, volcanologist at the University of California.

Evidence consists of obsidian knives and other artifacts, found buried under from two to three feet of pumice 60 miles from the mountain, along the Deschutes river. They were presumably dropped by the people in their panic-stricken flight. How deep the deposit originally was can only be conjectured, for much erosion has occurred in the centuries that have passed since the eruption. But even what is left is a testimony to its awesome magnitude.

These new finds confirm and extend knowledge of the long-vanished race of Indians, first intimation of which was given by the discovery a few years ago of sagebrush-bark sandals in a cave 80 miles east of Mount Mazama.

Science News Letter, April 15, 1939

IN SCIENCE

AERONAUTICS

Latest British Fighter Speeds 362 Miles an Hour

BRITAIN's latest fighting plane actually in service with Royal Air Force combat units, the Spitfire, has a top speed of 362 miles an hour at 18,500 feet, official figures released by the Air Ministry reveal.

The plane's climbing time to 11,000 feet with full load is 4.8 minutes.

Its speed, observers said, is probably about the same as that of the German Messerschmidt pursuit job, a specially prepared, stripped version of which set the landplane speed record of 394 miles an hour.

Science News Letter, April 15, 1939

ICHTHYOLOGY

American Black Bass Swarm in African Lake

AMERICAN largemouth black bass are very numerous in Lake Naivasha in Kenya Colony, Africa. They grow faster than they do in America and reach "whale" size, Dr. David H. Thompson of the Illinois Natural History Survey has been informed in a communication from Dr. Richard H. LePelley of the Scott Agricultural Laboratories, Nairobi, Kenya. (*Nature*).

The fish were introduced into the lake in February, 1929. There were 53 survivors of a shipment sent from Europe, from stock previously introduced there from America. The pioneers increased and multiplied wonderfully, feeding on the abundant frogs and small fish with which the lake was already well populated.

The biggest bass so far taken from Lake Naivasha weighed 6½ pounds. Naivasha bass averaged 14 per cent. heavier than their stay-at-home kindred of the same lengths taken from lakes in Illinois and Wisconsin. The faster growth and greater weight of the fish in Africa may be due to the absence of the keen competition for food that exists in the comparison lakes in this country.

Science News Letter, April 15, 1939

NCE FIELDS

PHYSIOLOGY

Stages of Going to Sleep Like Those of Epilepsy

YOU go to sleep in regular stages, and these follow in the same order as the steps of an epileptic seizure, Prof. Joshua Rosett, neurologist of Columbia University and director of the Brain Research Foundation, declares in a new book, *The Mechanism of Thought, Imagery, and Hallucination*. (Columbia University Press).

First you go through a period when the dark room and soft bedding serve to cut off stimulation of your senses and your thoughts become active.

Worriers may desert the attempt to woo sleep at this point.

Next comes a period of active imagination when we build castles in the air or are terrified by pictures of what might happen—falling off a cliff, being buried alive, and so on.

The third stage brings hallucinations or vivid dreams. The fourth stage brings startling, jerking movements such as that which may go with the dream of falling from the cliff. This movement usually awakens the sleeper.

Science News Letter, April 15, 1939

MEDICINE

New Wrinkles In Gland Treatments

SCIENTISTS are getting closer every day to what amounts to successful gland transplantation by methods which do not involve transplantation at all.

The insulin treatment of diabetes is a classic example of this type of what might be called pseudo-transplantation, but which scientists term substitution therapy. In diabetes as everyone now knows, certain cells in the pancreas, which is a gland, do not produce enough of the chemical substance, insulin, which regulates the body's sugar utilization. By giving insulin extracted from glands of cattle, however, the diabetic patient's deficiency is made up. The effect is close to what might be achieved if he could be given a new set of insulin-producing cells in his pancreas. It is not the same, obviously, because, for one thing, the patient must continue to get doses of insulin day after day, since the amount given one day may be used up by the next day.

One step toward improving the situation was the development of "slow-action" insulins. By the addition of certain chemicals, insulin can be altered so the body absorbs it more slowly, and the patient can be given larger doses at a time, but at less frequent intervals. The effect presumably produces a situation in the body more like that brought about by normal insulin-producing cells.

Another step in this direction—not with insulin but with sex hormones—has been taken by English scientists. They implanted small pills of dry crystals of the sex hormones under the skin of experimental animals, with very effective results. By weighing the pills before implantation, removing them after 10 days and weighing them again, the rate of absorption was determined.

While this is not transplantation, it comes close to it as a method for giving a long-time supply of a necessary gland chemical in one simple operation.

Science News Letter, April 15, 1939

CHEMISTRY

Five Lalor Fellowships Awarded in Chemistry

FIVE research fellowships, each carrying a stipend of $2,500 for a year's work, were awarded by the trustees of the Lalor Foundation. The candidates will carry on research in American and English laboratories, concentrating on problems in chemistry and related subjects.

From a field of 51 applicants the following were chosen: Dr. Otto Karl Behrens of the Rockefeller Institute, to work at the University of Cambridge, England; Dr. Andrew Calvin Bratton of the Johns Hopkins University Medical School, to continue work at that institution; Dr. Robert Byron Jacobs, to continue at the Massachusetts Institute of Technology; Dr. William Earl Roseveare of the University of Wisconsin, to work at Princeton University, and Dr. Charles E. Waring of Brooklyn Polytechnic Institute, to work at the University of Oxford, England.

Of the original group of 51 applicants, 67 per cent. signified intention to conduct research in American Universities, 25 per cent. chose British institutions and 8 per cent. stated that they wished to work in Continental Europe. None chose Germany.

Science News Letter, April 15, 1939

PSYCHOLOGY

Rats Find Hidden Food Even After Long Delay

RATS AND DOGS and cats may have a higher type of intelligence than we have credited them with.

Animal psychologists have thought that "out of sight is out of mind" for these animals. The ability to hold a problem in mind until such time as it is physically possible to reach a solution—that was a distinction of man.

The test for revealing this trait was a sort of scientific variation of the old shell game. The subject is allowed to see food hidden in, say, one of three or four boxes. He is restrained for the delay period and then allowed to try to find his reward.

Men, of course, are not fooled by such a simple trick. But dogs, cats, and rats could find their way to the correct shell or box, it was thought, only by "pointing," or keeping their bodies fixed in the right direction, as pussy keeps her nose steadily toward the particular hole from which she expects the mouse to dart.

Man's advantage was believed due to his ability to verbalize—the ability to think "It's in that one on the right."

Now man must give up this distinction, for in the psychological laboratories of Duke University, Dr. Fletcher McCord has found that the humble rat shares the ability to win at the shell game when it is played fair. The experiment is reported to the *Journal of Comparative Psychology*.

Playing fair, in this case and from the point of view of the rat, meant painting the doors behind which the food was hidden so that the poor rat could tell them apart. And then it meant making sure that the rat saw the food hidden. It is necessary to rattle the pan a bit to get his attention.

After that no cues were given Mr. Rat. Because his nose is keen, identical delicious smelling pans of food were placed behind all four doors used in the test, but behind three were also barriers so that when Mr. Rat jumped to the right door he got through, but when he jumped at any wrong door he got only a thump on the nose.

He could choose the right door, it was discovered, even after a delay of eight minutes.

And Dr. McCord rather scoffs at the idea that the rats used even a sort of muscular equivalent of language in this task.

Science News Letter, April 15, 1939

CHEMISTRY—MEDICINE

Hope of Curing Tuberculosis, Influenza and Leprosy

New Derivative of Sulfanilamide is Soluble in Fat So Scientists Hope It May Penetrate Tubercle Bacillus

CURE of tuberculosis, leprosy and influenza by chemical derivatives of sulfanilamide, medicine's new weapon against a wide variety of streptococcic infections, is a new hope offered by science today as a promise of intensive chemical research now under way. (*See also report of research on sulfapyridine in this issue, page 227*).

Reported at the meeting of the American Chemical Society in Baltimore were studies which foreshadow such possibilities, spurred by the success with sulfanilamide. Dr. M. L. Crossley, research director, and E. H. Northey and Martin E. Hultquist of the Calco Chemical Company described their new discoveries, emphasizing that it was only preliminary work which offered no cures at the present time.

"Of the many compounds prepared, the compound N-one-dodecanoyl-sulfanilamide is the most outstanding," the chemists declared. "This compound can be pictured as a combination of sulfanilamide with part of a fat. It has the properties of both its parents in that it penetrates the fatty tissues of the body carrying the therapeutic properties of the sulfanilamide. In studies on experimental animals it has shown a definite superiority to sulfanilamide in treating streptococcic infections and tuberculosis.

"The preliminary tests on animals carried out by Dr. David R. Climenko in the division of pharmacological research of the Calco Chemical Company have shown the dodecanoyl product to be of a low order of toxicity in comparison with sulfanilamide."

Massive doses of human tubercle bacilli injected into experimental guinea pigs produced only small local lesions at the site of the injection instead of generalized manifestations of the disease throughout the body. It has also been shown that low concentrations of the new sulfanilamide derivative inhibit the growth of the tubercle organisms for 90 days in test tube experimental cultures.

Characteristic fact about the new form of sulfanilamide is its fat solubility. Tentatively the scientists suggest that this property may aid the drug in penetrating the fatty, waxy pellicle which surrounds the tubercle bacillus and which makes it impervious to many chemotherapeutic agents.

The scientists emphasized that the drug does not cure tuberculosis in animals but rather acts to arrest the spread of the infection and localizes it at the site of entry of the tubercle bacillus. The tubercle bacillus is one of a group known as acid-fast organisms. The organism causing leprosy is another. Of this the scientists reported:

"In view of the promising results obtained with this drug in the treatment of experimental tuberculosis, it is suggested, and attempts will be made to demonstrate this experimentally, that the drug may be equally effective in the treatment of other diseases caused by the acid-fast bacilli, such as leprosy."

Science News Letter, April 15, 1939

Make Vitamin Glow Green

MAKING a vitamin in milk glow to a brilliant green color is the newest feat of science in estimating milk's content of this important dietary chemical known as riboflavin, it was reported by Prof. David B. Hand of the New York State College of Agriculture at Cornell University.

Riboflavin is the green coloring matter of milk whey. When blue light shines on the whey the riboflavin turns intensely green by fluorescence. By observing the intensity of the green light, scientists can measure the content of the riboflavin present.

Previously it has been necessary to feed whey to animals and wait for them to grow measurably.

Sunlight is bad for milk, Prof. Hand continued, because it causes the rapid destruction of vitamin C, which aids in preventing scurvy. Milk fresh from the cow has a good supply of vitamin C but by the time it is bottled and delivered most of the vitamin C content is gone.

Prof. Hand and his colleagues, Paul F. Sharp and E. S. Guthrie, of Cornell University, have found, that it is the presence of vitamin G in milk which accounts for the destruction of vitamin C by light.

"It seems strange that one vitamin should cause the disappearance of another," Prof. Hand said, "but it should be remembered that this only happens in the light and milk was never intended in nature to be exposed to light. Air or oxygen also takes part in the destruction of the vitamin C. The vitamin is stable if all dissolved air is removed from the milk."

Scientists at Cornell University have developed methods for bottling milk in a vacuum so that it may still possess vitamin C when delivered to the consumer. Fresh milk contains enough vitamin C for each quart to suit the requirements of an average person per day.

Science News Letter, April 15, 1939

Chemistry Causes Imbecility

A FORM of imbecility, which is apparently caused by a defect in the body's chemistry, was described by Drs. Richard J. Block and George A. Jervis of the New York State Psychiatric Institute, New York City.

The mental defect has been given the name phenylpyruvic oligophrenia. It appears to be caused by an inborn error in metabolism similar to albinism. Just as diabetes is due to the inability of the body to use up glucose in the blood, this particular mental ill seems to be caused by the body's inability to burn up the compound known as phenylalanine, an amino acid necessary to growth.

Just as diabetes is detected by the presence of sugar in the urine, so this form of imbecility can be detected by testing the urine for phenylalanine. Persons thus afflicted have from 20 to 30 times as much phenylalanine in their blood as normal persons. It was this chemical test that led to the discovery of the disease by Dr. A. Fölling of Oslo, Norway, in 1934.

This form of imbecility is rare, occurring in only one case out of 25,000 The relationship between the high amount of phenylalanine in the blood and the defect in brain development is not settled yet, the scientists pointed out. It may be that the presence of relatively large amounts of the phenylalanine in the blood and spinal fluid may act toxically on the nervous tissue and impair or destroy brain functioning. Or it may be that almost exactly the opposite is true; that the brain needs phenylalanine for its normal growth and development

but is unable to obtain the chemical in sufficient amounts and thus remains at a low level of development.

"It is hoped that a careful study of phenylpyruvic oligophrenia will permit us to arrest the spread of this type of mental deficiency and possibly prevent its onset in certain cases," the scientists declare in their report. It is hoped that special diets low in proteins may arrest the mental affliction. The brain may then go on and develop normally.

It is definitely shown that the disease is hereditary and that—at least so far—it does not appear among Jews.

Science News Letter, April 15, 1939

Anti-Coagulant in Body

THE DISCOVERY of a new chemical acid in the human body which keeps blood from clotting was described by Drs. Irving J. Greenblatt and M. X. Sullivan of Georgetown University.

The chemical is aspartic acid, an amino acid found in plant and animal tissue. It is the most effective of all naturally occurring body chemicals in its anti-coagulating properties. While not yet definitely proved, aspartic acid is possibly the body's most effective agent in keeping blood fluid in the veins and arteries. It thus may be the body's weapon against thrombosis.

"The present study," report the scientists, "shows for the first time that an amino acid normally present in the foodstuffs and liberated therefrom by digestion has a marked anti-coagulation action on blood in the test tube."

Studies on animals seem to show that there is no toxic effect when sizable injections of sodium salts of aspartic acid are given. Pending further studies of possible finer injurious effects on the kidney, which have been noted in the cases of a number of other anti-coagulants, sodium aspartate is being used in test tube experiments.

While further work must yet be done before the new chemical can be recommended to replace sodium citrate as the anti-coagulant in blood collection, blood transfusion and blood banks, such a possibility is visualized for the new discovery.

Science News Letter, April 15, 1939

$2 Gold Kid Shoes

IT IS now possible to produce tarnish-proof metallic finishes on fabrics through the aid of the new resins, Dorman McBurney of the E. I. du Pont de Nemours and Company told the society.

Gold and silver finishes have been particularly popular and have found wide use in the shoe and slipper industry where $2 evening slippers closely simulate the genuine article.

Science News Letter, April 15, 1939

"Rainbow" Eggs Displayed

"RAINBOW" eggs, with red, white and green colored yolks, were exhibited at the meeting with a report on dietary feeding by scientists of Kansas State College.

The green-colored egg yolks were produced by feeding hens a molasses oatgrass silage. Actually the yolks are olive colored. These green eggs were found to contain relatively high percentages of oxygenated yellow pigments (combined with oxygen) in such a way that when mixed with the protein of the egg yolk they gave the olive color.

Such a combination is already known in nature, reported the research team of Dr. W. J. Peterson, Prof. J. S. Hughes, L. F. Payne and W. M. Proudfit. The blue-green color of lobsters contains the red-colored pigment astacene which combines with the protein of the shell to give the blue-green color. When the lobster is killed in boiling water this red pigment produces the characteristic pink-red color. Lobster shells, when fed to hens, reported the scientists, produce eggs with yolks of a red-orange color.

By eliminating carotene (the yellow pigment that colors carrots) from the diet of hens it is possible to produce colorless yolks, which when hard boiled are as white as snow.

Science News Letter, April 15, 1939

MATHEMATICS

Occurrence of Prime Numbers Still Mystery

ALTHOUGH the civilized world has been using numbers for centuries, the abstractions 1, 2, 3 and so on still possess many unusual properties. For example a number is called a "perfect" number if it is equal to the sum of its divisors smaller than itself.

Thus 6 is the first perfect number, for its divisors are 1, 2 and 3 and the sum of these equals 6. All perfect numbers so far known are even numbers like 6. Never has an odd perfect number been found but it has not been proved that odd perfect numbers do not exist.

Another puzzle of mathematical numbers is the occurrence of prime numbers. A prime number, you will recall, is a number divisible only by one and by itself. Thus 2, 3, 5, 7, 11, and 13, are primes while 4, 6, 8, 9, 10, 12, 14 and 15 are not primes.

The occurrence of primes in the number sequence is very irregular and mathematicians for many years have been challenged to find rules for their occurrence.

In a report to the American Mathematical Society Dr. J. Barkley Rosser of Cornell University describes his progress on this matter.

Dr. Rosser cannot predict exactly how primes occur, but he has found the result that the nth prime is never less than n times the logarithm of n and never exceeds this quantity by more than 2n log log n.

Using his results, Dr. Rosser can show that if one divides each of the first 1,000,000,000,000 prime numbers into one and adds up all the quotients, the sum lies between 3.58 and 3.92.

In 1742 the mathematician Goldbach suggested that every even integer is the sum of two primes. Laboriously this has been tested correct up to the number 10,000 but has not yet been proved.

Science News Letter, April 15, 1939

AERONAUTICS

Government Will Train Aviation Mechanics

PLANS for training aircraft mechanics at a cost of $1,000 each from government funds will be announced in a few weeks by a special interdepartmental committee composed of representatives of six Federal agencies.

About 10,000 mechanics will be trained yearly at a cost of $10,000,000, it is understood, although a final decision as to the number involved and the total expenditure has not yet been made. The decision will be made following completion of surveys of training facilities and of the need for mechanics now under way.

The program, which follows launching of the plan for training 20,000 pilots a year, will be divided into three parts, it was learned.

Federal funds now going to states to provide aviation training in public high schools will be expanded. The present requirement that the states match the federal funds dollar for dollar will be scrapped.

Funds will also be made available, under the plan, to pay the tuition of student mechanics in recognized private training schools. These two provisions are designed to meet the immediate needs of aircraft factories, national defense and civilian aviation for plane construction workers and maintenance men under the air armament schedule.

Factories will be urged to add apprentices, to meet the long-range requirements of the aviation industry.

About two years will be required to turn out each fully qualified mechanic, as compared with a few weeks for teaching a student pilot how to fly. Cost per student will be about three times the per student cost of the pilot training program, for which $7,300,000 is being appropriated.

Establishment of the interdepartmental committee and detailing of the program follows Federal recognition of a serious shortage of skilled mechanical labor which threatens the expanding aviation industry.

Included on the committee are the Civil Aeronautics Authority, the Army, the Navy, the Federal Office of Education, the National Youth Administration and the Civilian Conservation Corps.

About 40,000, nearly all skilled mechanics, are now employed in the 16 major aircraft factories throughout the United States. Almost as many more, 38,000, will be needed during the next few years to fulfill the air armament program, which envisions purchase of about 5,000 planes for the Army and Navy, according to the Aeronautical Chamber of Commerce.

Nowhere near that number are now receiving the rigorous training which is necessary to qualify men for building or taking care of high performance airplanes. Nearly 7,000 high school students received aviation training last year through joint grants of the Federal Office of Education and the 48 states.

The program will be swung into action as soon as possible, as early as next month, if that can be done, it was stated.

Science News Letter, April 15, 1939

PSYCHOLOGY

Removal of Tenth of Brain Leaves Patient With Higher IQ

Childishness and Loss of Memory Which Followed Head Injury Gone When Damaged Tissue Was Removed

HOW a surgeon's scalpel increased a man's IQ (intelligence quotient) by cutting away more than a tenth of his brain was told to the Eastern Psychological Association meeting at Bryn Mawr.

Mr. X, 30-year-old farmer, had been for ten years a helpless epileptic following a bad skull fracture. Dr. Wilder Penfield, of the Montreal Neurological Institute, cut away the injured part of the brain, a full third of the gray matter of the front region.

Before this radical operation Mr. X's IQ was 83. Afterwards on three successive tests it was 94, 89, and 98.

This strange case of Farmer X was related by Dr. D. O. Hebb, psychologist of the Institute, who examined him. The fact that Farmer X is happily on the road to recovery as a useful citizen will bring encouragement to those who face the necessity of brain surgery. It may lead scientists to a complete revision of present theories of brain function.

The frontal lobes of the brain, one-third of which were removed in X's operation, have been previously believed essential to abstract thinking. Yet, for the kind of mental work involved in the familiar intelligence tests, Farmer X is not worse off, but actually better than before the operation.

Before the operation Farmer X suffered violent epileptic attacks which left him in a state of automatism. Between attacks he was often childish, very forgetful and unresponsive. He was irresponsible and quite incapable of earning a living.

Now childishness and forgetfulness are gone. He has not yet recovered physically from the operation, but his relatives recognize him as quite well mentally and "just like any other person."

Dr. Hebb declared the case "a triumph for surgical therapy." It shows, he contended, that mental deterioration in cases of injury to the frontal lobes is not necessarily caused by the surgical removal of parts of the brain.

Farmer X's former silliness and loss of memory are attributed to presence in his brain of damaged tissue. The symptoms disappeared when the damaged tissue was cut away.

The brain, said Dr. Hebb, is like "an automobile engine, which will run better with a spark plug completely removed than with a plug badly connected and firing at the wrong time."

Dr. Hebb warned against the conclusion that removal of large areas of the frontal lobes has absolutely no effect upon intelligence. He thinks there must be some effect but it is not of the sort measured by ordinary intelligence tests.

Ordinary intelligence tests may not measure present ability to learn, but the products of past learning, he suggested.

The brain's frontal lobes may be necessary for the building up of intelligence. Yet the use of intelligence, once it is acquired, may not depend upon that particular area of the brain. If so, an injury to the frontal lobes occurring in infancy would prevent the development of normal intelligence. But happening, as it did to Farmer X, after the mind was developed, would not injure it.

If this theory is correct, then pencil-and-paper intelligence tests would not show up the effects of an adult's loss of the brain's frontal lobes, he declared. They would be betrayed only in a possible lack of ability to adapt himself to new changes in his surroundings and in ability to plan his life and organize his affairs.

Science News Letter, April 15, 1939

Delay Baffles Monkey

NEW LIGHT on the function of these important frontal lobe areas in the brain of monkeys was reported to the same meeting by Dr. T. L. McCulloch, of the Yale Laboratories of Primate Biology.

A young rhesus monkey was trained by Dr. McCulloch to distinguish differences in weight in two trays in order to get a reward of food. After the animal had lost both frontal lobes he was still able to distinguish the differences in weights if allowed to "weigh" one right after the other. If a delay of more than a few seconds was interposed between the two weighings, however, his accuracy was lost.

Science News Letter, April 15, 1939

Breath Rests in Daydreaming

AS YOU daydream these spring days about your best girl or the sunny banks of a fishing stream, your breathing is interrupted by a lazy pause after each exhalation.

These breathing pauses may last as long as seven seconds, Dr. Herbert Barry, Jr., of Tufts College, told the meeting. As much as thirty seconds from each daydreaming minute may be taken up by the respiratory rests. And during all

that time your system is being deprived of life-saving oxygen.

The pauses occur, Dr. Barry found, only during the time that the individual is permitted to daydream. Breathing while reading a book is much more rapid and is uninterrupted.

Discovery of these respiratory rests is particularly interesting to psychiatrists, Dr. Barry indicated, because schizophrenic patients spend a great deal of time in daydreaming, and because this mental disease is accompanied by a reduction of oxygen in the blood stream.

Six schizophrenic patients were tested by Dr. Barry in collaboration with Dr. William Corwin of the Metropolitan State Hospital at Waltham, Mass. These were in addition to 30 normal college students whose breathing was also measured.

One patient, a shy 18-year-old boy, "always serious minded, not interested in girls, a good student with only a few friends," was among those tested. Not only was his breathing constantly interrupted by rests while he daydreamed, but the breaths he did take were very shallow.

The daydream pauses would tend to produce anoxemia, the same trouble that makes the high-altitude flyer groggy, unless they were counteracted by unusually deep or rapid respiration, Dr. Barry contended.

But the schizophrenic, lost in his self-centered reveries, is taking very shallow breaths and taking them slow with long pauses in between.

Further research, particularly of the blood changes in oxygen content during and after daydreaming, was urged by Dr. Barry.

Science News Letter, April 15, 1939

Altitude Affects Vision

AIRPLANE pilots and passengers flying at high altitudes cannot see as well in dim illumination after looking at a bright light. At 15,000 feet, the amount of illumination necessary for vision is 150 per cent. greater than at sea level, Drs. Ross A. McFarland and J. N. Evans, of Harvard University, told the meeting.

Only five subjects out of 20 remained unaffected by the altitude at 7,400 feet, although psychological tests at that altitude show no reliable changes in mental ability. At 11,000 feet only one subject was unaffected. At 15,000 feet all were affected.

All the changes were abolished by administration of oxygen.

Science News Letter, April 15, 1939

Animals Hear Before Birth

UNBORN animals can hear much earlier than has been supposed, Dr. Leonard Carmichael, president of Tufts College, told the psychologists.

By using complicated surgical operations, and a technique for tapping the electrical response in the cochlea of the ear of unborn guinea pigs, Dr. Carmichael was able to detect hearing in tiny creatures who had lived only about three-fourths of their prenatal lives. This would correspond to a time in humans about two and a quarter months before birth.

The unborn animals at that early stage of development could already be startled by what they heard.

Science News Letter, April 15, 1939

Allergic Children Lead

CHILD sufferers from hay-fever, asthma, hives and other allergies are not only more likely to be superior in intelligence than normal children but they are stronger in leadership, Miss Olga E. de Cillis and Dr. Bernard F. Riess, of Hunter College, told the psychologists.

Personality tests were given to 139 eight- to sixteen-year-old child patients in the Pediatric Allergy Clinic of New York Hospital and these were compared with results on 117 allergy-free public school children.

The allergic children are more inclined to leadership and the go-getter type of personality. They will talk back to a friend who is bossy, "tell the goceryman that it is my turn when he tries to wait on someone else first," and they start the fun at a quiet party. They like to spend money, feel at home at parties and don't keep quiet when with other people. They don't worry about their mistakes.

Children with skin allergies have higher scores in leadership than do the other allergics. And those with skin and mixed allergies are more likely to be emotionally unstable.

Science News Letter, April 15, 1939

Dual Personality Explained

HOW the Indian arrow poison curare acts to produce a dual personality is revealed in animal experiments reported by Dr. E. A. Culler, of the University of Rochester.

What dogs learn in a normal state is forgotten when they are under the influence of the strange drug curare, Dr. Culler found. What they learn while under the influence of the curare is forgotten when they come out of it.

This Jekyll-and-Hyde action of curare is due to the fact, he discovered, that the drug depresses the brain cortex or that part of the higher nervous system between the cortex and the spine. Learning then can take place only through subcortical parts of the nervous system.

In the normal state the cortex is in charge of this work.

Science News Letter, April 15, 1939

Fascist Ideas Denounced

THE ASSUMPTION of Fascist philosophers that the public can be propagandized into any sort of attitude was denounced by Dr. Samuel Katz of Princeton University, chairman of a symposium sponsored by the Society for the Psychological Study of Social Issues.

"Their philosophy that the rewards go to the cleverest or most deceitful manipulators and propagandists," he declared, "seems to me not only bad ethics but poor social psychology."

Research was described by Dr. George W. Hartmann of Columbia University which shows that propaganda is effective only when the minds of the public are receptive to it.

How dolls and finger drawings are being used to study the development of social attitudes and prejudices in children too young to express them in words was described by Dr. Gardner Murphy, of Columbia University. This method, previously used by physicians to learn the inner troubles of problem children, is proving an excellent tool for research in this new field, he said. A child who cannot tell how she feels toward authority will show it clearly when given a policeman doll to play with.

Science News Letter, April 15, 1939

List Displaced Psychologists

MORE than a hundred qualified professional psychologists and other scholars, including many of world renown, are now displaced from their positions by the present European situation and desperately in need of refuge and employment, it was revealed.

The names of these scientists are being withheld for fear of reprisals on them or on their families, but anyone knowing of opportunities for them to do scientific research are urged to communicate with Prof. G. W. Allport of Harvard University or Dr. Barbara S. Burks, Carnegie Institution of Washington.

Science News Letter, April 15, 1939

ECOLOGY

NATURE RAMBLINGS
by Frank Thone

The Prairies Remember

DROUGHT is a fading memory in the minds of the people, washed dim by a couple of years of good rains. But the prairies remember better. It will be a long time before all traces of the years of the Great Thirst, 1934-1937, will have vanished from the grasslands of the West.

Effects of the crisis on the makeup of prairie grass communities are reported in *The Botanical Gazette* (March) by Prof. J. E. Weaver and Dr. F. W. Albertson, of the University of Nebraska, who have kept continuous track of them since the very beginning of the cycle of dry years.

Normally, prairies are dominated by perennial grasses, whose deep roots enable them to hold out through the regular annual weeks of drought that come in late summer. But when the drought stretched out into months and years, the old dominants began to die. First to go was bluegrass, which isn't really a prairie grass anyway but an introduced outsider. But the true prairie dominants, the bluestem grasses, presently began to die also. Along with them went some of the most characteristic non-grass plants ("forbs" in the ecologist's handy terminology) like wild sunflower and buffalo bean.

Into the land thus vacated trooped many species better able to survive drought, representing several diverse and distinct types. There were quick-growing weeds like pepper-grass, horseweed and some kinds of wild aster and goldenrod. There were drought-resistant grasses, some of them fairly valuable like wheat grass, grama and buffalo grass, others of little worth like weedy bromes and six-weeks-fescue. There were plants able to store reserve supplies in fleshy roots and bulbs, like spiderwort, oxalis, and wild onion. Yet even with all these coming in, much of the ground has remained bare between their clumps.

The prairies are greatly changed. But no change is permanent, and already new changes are crowding in. Some of the more ephemeral weeds have already dwindled, some of the old grasses and forbs are creeping back. But whether the old prairie will enjoy a complete resurrection is something that time alone can tell.

Science News Letter, April 15, 1939

ANATOMY

"Nanny" Becomes "Billy" In Sex Change of Goat

SEX change stories, of women turning into men and hens becoming roosters, were paralleled by an account of a nanny-goat starting to become a billy-goat, related to the American Association of Anatomists by Dr. R. T. Hill of the Indiana University School of Medicine.

The animal was obviously female when born. However, she began to develop peculiar anatomical characters in early kidhood, indicating the possibility of abnormal internal changes. For one thing, her udder was not developing.

When she was eight months old, Dr. Hill performed a surgical operation on her, and found that she had male sex glands where her ovaries should have been. He removed one of them and examined it microscopically, finding that it was indubitably male, but not completely developed. Six weeks later he operated again, removing the other gland, and found that maleward development had progressed still further.

Science News Letter, April 15, 1939

Chicken Leg on Turkey

GRAFTING the leg of an embryo white leghorn chick onto the body of an embryo turkey was accomplished by Dr. Herbert L. Eastlick of the University of Missouri, who told the meeting of his results. Unfortunately for the complete success of the experience, the graft-bearing turkey chick died before hatching. Nevertheless, the white leghorn leg had already "taken hold" and was developing normally. It even showed the effects of its turkey "environment," for it was developing dark feathers instead of the white ones it normally should have had.

Science News Letter, April 15, 1939

Gland Controls Blood

RED blood corpuscles in the body are controlled in part by the activity of the hypophysis or pituitary gland, small but important organ located at the base of the brain, already known to "boss" a considerable number of other bodily functions. Researches adding a new job to this gland's many occupations were reported by a four-man-team from New York University.

When rats were deprived of their pituitaries, the number of their red blood cells dropped almost to one-half the normal count. This decline was gradual, taking about two months, and the anemic condition persisted for another month, it was stated.

The group conducting the researches consisted of Drs. Erwin P. Vollmer, Albert S. Gordon, Irving Levenstein and Harry A. Charipper.

Science News Letter, April 15, 1939

● Earth Trembles

Information collected by Science Service from seismological observatories and relayed to the Jesuit Seismological Association resulted in the location of the following preliminary epicenter:

Wednesday, April 5, 11:42.4 a. m., EST

In Pacific ocean in region of New Caledonia, east of Australia and North of New Zealand.

For stations cooperating with Science Service in reporting earthquakes recorded on their seismographs see SNL August 13.

•First Glances at New Books

Sociology

NEW HORIZONS FOR THE FAMILY—Una Bernard Sait—*Macmillan,* 772 p., $4. "For the first time," the author says, "it becomes possible to view the family from a scientific and experimental point of view; deliberately to plan a family pattern designed to facilitate the performance of the family's essential functions, while remaining alert to modify this pattern on the basis of results and in the light of newer knowledge." In the family can be cultivated the socialized disposition and cooperative attitudes necessary to "avoid control of the economic order by coercive power"—a vital element in that race between education and catastrophe described by H. G. Wells.

Science News Letter, April 15, 1939

Psychology

CARDINAL ASPECTS OF SPEECH—James Murray and Wesley Lewis—*Prentice-Hall,* 316 p., $2.50. A text from the University of California at Los Angeles for students of public speaking.

Science News Letter, April 15, 1939

Photography

WHERE AND HOW TO SELL PHOTOGRAPHS—H. Rossiter Snyder—*Fomo,* 38 p., 50 c. Useful hints on selling pictures and a list of some of the markets.

Science News Letter, April 15, 1939

Paleontology

PREHISTORIC LIFE—Percy E. Raymond—*Harvard Univ. Press,* 324 p., $5. An excellently written popular work on paleontology, in which the dynamic approaches of paleoecology and evolution predominate, this book will be appreciated by serious lay readers as well as by those already initiated in geology.

Science News Letter, April 15, 1939

Psychology

THE TROUBLED MIND—Harry Roberts and Margaret Nelson Jackson—*Dutton,* 284 p., $2. A book by British authors intended to inform the layman about mental diseases and the treatment of the mentally ill.

Science News Letter, April 15, 1939

Psychology

THE ART OF COUNSELING: How to Gain and Give Mental Health—Rollo May—*Cokesbury Press,* 247 p., $2. The material in this book is developed from lectures given at seminars of student workers of the Methodist Episcopal Church, South. Although psychologists will probably be sympathetic with this effort to prepare religious workers to aid in promoting mental hygiene, they may question some of what the author says concerning the reading of character and transfer of thought.

Science News Letter, April 15, 1939

Sociology

URBAN SOCIOLOGY—Earl E. Muntz—*Macmillan,* 742 p., $3.75. A comprehensive textbook from New York University.

Science News Letter, April 15, 1939

Education

PARENT EDUCATION: A SURVEY OF THE MINNESOTA PROGRAM—Edith A. Davis and Esther McGinnis—*Univ. of Minnesota,* 153 p., $2.50. Intimately tied up with the education of very young children is the education of parents. Here is a survey of what one program has accomplished.

Science News Letter, April 15, 1939

Mathematics

GENERAL ANALYSIS. Part II, The Fundamental Notions of General Analysis—Eliakim H. Moore and Raymond W. Barnard—*American Philosophical Soc.; distributed by Univ. of Penna. Press,* 255 p., $3.

Science News Letter, April 15, 1939

Anthropology

THE MENOMINI INDIANS OF WISCONSIN; A Study of Three Centuries of Cultural Contact and Change—Felix M. Keesing—*American Philosophical Soc.; distributed by Univ. of Penna. Press,* 261 p., $2.50. The historical perspective in this anthropological study gives it particular value. As Prof. Keesing points out, his historic and critical approach makes it possible to trace in some detail processes of cultural change, and also to test how far ethnologists can reconstruct pre-Columbian life through their studies of tribes today.

Science News Letter, April 15, 1939

Engineering

PLAY SPACE IN NEW NEIGHBORHOODS—*National Recreation Association,* 23 p., 25 c. A report on standards of outdoor recreation areas in housing developments.

Science News Letter, April 15, 1939

Engineering

CATALOG OF THE MECHANICAL COLLECTIONS OF THE DIVISION OF ENGINEERING, UNITED STATES NATIONAL MUSEUM—Frank A. Taylor—*Govt. Print. Off.,* 203 p., 37 plates, 50 c.

Science News Letter, April 15, 1939

Psychology

THE MECHANISM OF THOUGHT, IMAGERY, AND HALLUCINATION—Joshua Rosett—*Columbia Univ. Press,* 289 p., $3. See page 233.

Science News Letter, April 15, 1939

Ornithology

THE GOLDEN PLOVER AND OTHER BIRDS—Arthur A. Allen—*Comstock Pub. Co.,* 324 p., illus., and color plates, $3. The golden plover nests in only one chapter; the rest of the book gives room for a considerable variety of birds, from starling to cedar waxwing, from marsh hawk to pied-billed grebe. There are lovely color plates by Sutton.

Science News Letter, April 15, 1939

Agricultural Economics

ON AGRICULTURAL POLICY, 1926-1938—Joseph S. Davis—*Food Research Inst., Stanford Univ.,* 494 p., $3. The author, one of the directors of the Food Research Institute and formerly associated with the Brookings Institution, disapproves of the present farm policies of the U. S. Department of Agriculture.

Science News Letter, April 15, 1939

Home Economics

WHAT TO DO WITH HERBS, With an Appendix of Recipes—Mary Cable Dennis—*Dutton,* 91 p., $1.50. Better flavor is coming into our lives, quite literally, with the revived interest in herb gardening and the use of herbs in cookery. This little book tells, chattily, about growing and using herbs, and has a lot of mouth-watering recipes in an appendix.

Science News Letter, April 15, 1939

Psychology—Education

PSYCHOLOGY APPLIED TO TEACHING AND LEARNING—Coleman R. Griffith—*Farrar & Rinehart,* 650 p., $2.60. A good elementary textbook on educational psychology by the professor in this field at the University of Illinois.

Science News Letter, April 15, 1939

Education—Psychology

ADULT ABILITIES: A STUDY OF UNIVERSITY EXTENSION STUDENTS—Herbert Sorenson—*Univ. of Minnesota Press.,* 190 p., $2. Extension students in the United States range in age from the late teens to the seventies. In mental ability they are equal to the regular university students. Adults, the author concludes from his study, should exercise their minds both extensively and intensively in order to avoid an old age in which abilities drop below capacities.

Science News Letter, April 15, 1939